L2: Entry 100 of 112 File: USPT Jul 9, 1996

US-PAT-NO: 5534499
DOCUMENT-IDENTIFIER: US 5534499 A

TITLE: Lipophilic drug derivatives for use in liposomes

DATE-ISSUED: July 9, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ansell; Steve	Vancouver			CA

US-CL-CURRENT: 514/25; 424/1.21, 424/450, 514/2, 514/34, 514/449, 514/463, 536/17.2, 536/18.1, 536/4.1, 536/6.4, 549/432 , 549/510

CLAIMS:

What is claimed is:

1. A pharmaceutical compound for use in liposome and micellar formulations, said compound being a member selected from the group consisting of compounds of formula I and compounds of formula II: ##STR21## wherein, A is a member selected from the group consisting of a serine radical, an ethanolamine radical, a choline radical, a phosphocholine radical, a phosphoserine radical, a phosphoethanolamine radical, a glycerol radical, a phosphoglycerol radical, an inositol radical, a phosphoinositol radical, --NR.sup.1 R.sup.2, --OCOR.sup.3, --OH, --O--glucose, --O--galactose and --O--oligosaccharide;

wherein,

R.sup.1 and R.sup.2 are each members independently selected from the group consisting of H and lower alkyl; and

R.sup.3 is a member selected from the group consisting of alkyl radicals and unsaturated alkyl radicals;

X.sup.1 and X.sup.2 are each members independently selected from the group consisting of alkyl, unsaturated alkyl, alkyl linking group, and unsaturated alkyl linking group;

Y.sup.1 and Y.sup.2 are each members independently selected from the group consisting of --S--, --NH--, --NHCO--, --CO(CH.sub.2).sub.p CO.sub.2 --, --O--, .dbd.NNHCO--, --CO-- and --CO(CH.sub.2).sub.p CONH--, wherein p is an integer of from 0 to 8;

Z.sup.1 and Z.sup.2 are each independently a therapeutic agent; and

m and n are each independently an integer of from 0 to 1, with the proviso that n+m is at least 1; and with the further provisos that when m is 0, X.sup.1 is not a linking group, and when n is 0 that X.sup.2 is not a linking group.

2. A pharmaceutical compound of claim 1 wherein said compound is of formula I, and A is a member selected from the group consisting of a phosphocholine radical, a phosphoserine radical, a phosphoethanolamine radical, a

phosphoglycerol radical, and a phosphoinositol radical.

3. A pharmaceutical compound of claim 1 wherein said compound is of formula I and A is a member selected from the group consisting of --OCOR.sup.3, --O--glucose, --O--galaclose and --O--oligosaccharide.

4. A pharmaceutical compound of claim 1 wherein said compound is of formula I and A is --NR.sup.1 R.sup.2.

5. A pharmaceutical compound of claim 2 wherein m is 0, X.sup.1 is alkyl and Z.sup.2 is a therapeutic agent selected from the group consisting of paclitaxel, doxorubicin and podophyllotoxin.

6. A pharmaceutical compound of claim 2 wherein n is 0, X.sup.2 is alkyl and Z.sup.1 is a therapeutic agent selected from the group consisting of paclitaxel, doxorubicin and podophyllotoxin.

7. A pharmaceutical compound of claim 3 wherein m is 0, X.sup.1 is alkyl and Z.sup.2 is a therapeutic agent selected from the group consisting of paclitaxel, doxorubicin and podophyllotoxin.

8. A pharmaceutical compound of claim 3 wherein n is 0, X.sup.2 is alkyl and Z.sup.1 is a therapeutic agent selected from the group consisting of paclitaxel, doxorubicin and podophyllotoxin.

9. A pharmaceutical compound of claim 4 wherein m is 0, X.sup.1 is alkyl and Z.sup.2 is a therapeutic agent selected from the group consisting of paclitaxel, doxorubicin and podophyllotoxin.

10. A pharmaceutical compound of claim 4 wherein n is 0, X.sup.2 is alkyl and Z.sup.1 is a therapeutic agent selected from the group consisting of paclitaxel, doxorubicin and podophyllotoxin.

11. A pharmaceutical composition comprising a compound selected from the group consisting of compounds of formula I and compounds of formula II: ##STR22## wherein, A is a member selected from the group consisting of a serine radical, an ethanolamine radical, a choline radical, a phosphocholine radical, a phosphoserine radical, a phosphoethanolamine radical, a glycerol radical, a phosphoglycerol radical, an inositol radical, a phosphoinsitol radical, --NR.sup.1 R.sup.2, --OCOR.sup.3, --OH, --O--glucose, --O--galactose and --O--oligosaccharide;

wherein,

R.sup.1 and R.sup.2 are each members independently selected from the group consisting of H and lower alkyl; and

R.sup.3 is a member selected from the group consisting of alkyl radicals and unsaturated alkyl radicals;

X.sup.1 and X.sup.2 are each members independently selected from the group consisting of alkyl, unsaturated alkyl, alkyl linking group, and unsaturated alkyl linking group;

Y.sup.1 and Y.sup.2 are each members independently selected from the group consisting of --S--, --NH--, --NHCO--, --CO(CH.sub.2).sub.p CO.sub.2 --, --O--, .dbd.NNHCO--, --CO-- and --CO(CH.sub.2).sub.p CONH--, wherein p is an integer of from 0 to 8;

Z.sup.1 and Z.sup.2 are each independently a therapeutic agent; and

m and n are each independently an integer of from 0 to 1, with the proviso that n+m is at least 1, and with the further provisos that when m is 0 that X.sup.1 is not a linking group, and when n is 0 that X.sup.2 is not a linking group, in a micellar formulation.

12. A pharmaceutical composition of claim 11 wherein said micellar formulation comprises a member selected from the group consisting of lysophosphatidylcholine, lysophosphatidylethanolamine, lysophosphatidylserine, lysophosphatidylglycerol, acyl-polyoxyethylene esters, alkyl-polyoxyethylene ethers, phosphatidylethanolamine-polyoxyethylene conjugates, phosphatidic acid-polyoxyethylene conjugates and octyl glucopyranoside.

13. A pharmaceutical composition of claim 11 wherein said micellar formulation comprises 1-stearoyl-L-.alpha.-phosphatidylcholine.

14. A pharmaceutical composition of claim 11 wherein said compound is 1-oleoyl-2-(N-(4 '-O-(2"-taxyl)-succinoyl)-11-aminoundecanoyl)-L-.alpha.-phosphatidylcholine and said micellar formulation comprises 1-stearoyl-L-60 -phosphatidylcholine.

15. A pharmaceutical composition comprising a compound selected from the group consisting of compounds of formula I and compounds of formula II: ##STR23## wherein, A is a member selected from the group consisting of a serine radical, an ethanolamine radical, a choline radical, a phosphocholine radical, a phosphoserine radical, a phosphoethanolamine radical, a glycerol radical, a phosphoglycerol radical, an inositol radical, a phosphoinositol radical and --NR.sup.1 R.sup.2, --OCOR.sup.3, hydrogen, --O--glucose, --O--galactose and --O--oligosaccharide;

wherein,

R.sup.1 and R.sup.2 are each members independently selected from the group consisting of H and lower alkyl; and

R.sup.3 is a member selected from the group consisting of alkyl radicals and unsaturated alkyl radicals;

X.sup.1 and X.sup.2 are each members independently selected from the group consisting of alkyl, unsaturated alkyl, alkyl linking group, and unsaturated alkyl linking group;

Y.sup.1 and Y.sup.2 are each members independently selected from the group consisting of --S--, --NH--, --NHCO--, --CO(CH.sub.2).sub.p CO.sub.2 --, --O--, .dbd.NNHCO--, --CO-- and --CO(CH.sub.2).sub.p CONH--, wherein p is an integer of from 0 to 8;

Z.sup.1 and Z.sup.2 are each independently a therapeutic agent; and

m and n are each independently an integer of from 0 to 1, with the proviso that n+m is at least 1, and with the further provisos that when m is 0 that X.sup.1 is not a linking group, and when n is 0 that X.sup.2 is not a linking group, in a liposomal formulation.

16. A pharmaceutical composition of claim 15 wherein said liposomal formulation comprises a member selected from the group consisting of phosphatidylcholine, phosphatidylethanolamine, phosphatidylserine, phosphatidylglycerol, phosphatidylinositol, cholesterol, diglycerides, ceramides, phosphatidylethanolamine-polyoxyethylene conjugates and phosphatidic acid-polyoxyethylene conjugates.

17. A pharmaceutical composition of claim 15 wherein said liposomal formulation comprises egg phosphatidylcholine.

18. A pharmaceutical composition of claim 15 wherein said liposomal formulation comprises egg phosphatidylcholine and 1-stearoyl-L-.alpha.-phosphatidylcholine.

19. A pharmaceutical composition of claim 15 wherein said compound is 1-oleoyl-2-(N-(4'-O-(2"-paclitaxyl)-succinoyl)-11-aminoundecanoyl)-L-.alpha.-phosphatidylcholine and said liposomal formulation

comprises egg phosphatidylcholine and 1-stearoyl-L-.alpha.-phosphatidylcholine.

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☐ 1. Document ID: US 6416740 B1

L3: Entry 1 of 17 File: USPT Jul 9, 2002

US-PAT-NO: 6416740
DOCUMENT-IDENTIFIER: US 6416740 B1

TITLE: Acoustically active drug delivery systems

DATE-ISSUED: July 9, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 424/9.52; 424/450, 424/9.5, 424/9.51

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 6414139 B1

L3: Entry 2 of 17 File: USPT Jul 2, 2002

US-PAT-NO: 6414139
DOCUMENT-IDENTIFIER: US 6414139 B1

TITLE: Silicon amphiphilic compounds and the use thereof

DATE-ISSUED: July 2, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Shen; Dekang	Tucson	AZ		
Wu; Guanli	Tucson	AZ		

US-CL-CURRENT: 556/404, 556/405, 556/425, 556/427, 556/428, 556/436, 556/437

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 3. Document ID: US 6403056 B1

L3: Entry 3 of 17 File: USPT Jun 11, 2002

US-PAT-NO: 6403056
DOCUMENT-IDENTIFIER: US 6403056 B1

TITLE: Method for delivering bioactive agents using cochleates

DATE-ISSUED: June 11, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 424/9.51; 424/400, 424/450, 424/502, 424/9.52

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 4. Document ID: US 6231834 B1

L3: Entry 4 of 17 File: USPT May 15, 2001

US-PAT-NO: 6231834
DOCUMENT-IDENTIFIER: US 6231834 B1

TITLE: Methods for ultrasound imaging involving the use of a contrast agent and multiple images and processing of same

DATE-ISSUED: May 15, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Fritz; Thomas A.	Tucson	AZ		
Gertz; Edward W.	Paradise Valley	AZ		

US-CL-CURRENT: 424/9.51; 424/9.52, 600/431

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 5. Document ID: US 6180137 B1

L3: Entry 5 of 17 File: USPT Jan 30, 2001

US-PAT-NO: 6180137
DOCUMENT-IDENTIFIER: US 6180137 B1

TITLE: Etherlipid-containing multiple lipid liposomes

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 6. Document ID: US 6139819 A

L3: Entry 6 of 17 File: USPT Oct 31, 2000

US-PAT-NO: 6139819
DOCUMENT-IDENTIFIER: US 6139819 A

TITLE: Targeted contrast agents for diagnostic and therapeutic use

DATE-ISSUED: October 31, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Fritz; Thomas A.	Tucson	AZ		
Gertz; Edward W.	Paradise Valley	AZ		

US-CL-CURRENT: 424/9.52; 424/450, 424/9.51

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 7. Document ID: US 6133416 A

L3: Entry 7 of 17 File: USPT Oct 17, 2000

US-PAT-NO: 6133416
DOCUMENT-IDENTIFIER: US 6133416 A

TITLE: Inhibition of cell growth by an anti-proliferative factor

DATE-ISSUED: October 17, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wilson; Deborah R.	Houston	TX		
Lapadat-Tapolsky; Mary	The Woodlands	TX		
Timmons; Therese M.	Houston	TX		
Lee; Julia A.	Houston	TX		
Almond; Brian D.	Houston	TX		
Roth; Jack A.	Houston	TX		

US-CL-CURRENT: 530/300; 424/283.1, 436/63

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 8. Document ID: US 6123923 A

L3: Entry 8 of 17 File: USPT Sep 26, 2000

US-PAT-NO: 6123923
DOCUMENT-IDENTIFIER: US 6123923 A

TITLE: Optoacoustic contrast agents and methods for their use

DATE-ISSUED: September 26, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Wu; Yunqiu	Tucson	AZ		

US-CL-CURRENT: 424/9.52; 424/450, 424/9.1, 424/9.2, 424/9.3, 424/9.6, 514/410

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 9. Document ID: US 6120751 A

L3: Entry 9 of 17 File: USPT Sep 19, 2000

US-PAT-NO: 6120751
DOCUMENT-IDENTIFIER: US 6120751 A

TITLE: Charged lipids and uses for the same

DATE-ISSUED: September 19, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 424/9.51; 264/4, 264/4.1, 424/450, 424/502, 424/9.52, 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 10. Document ID: US 6090800 A

L3: Entry 10 of 17 File: USPT Jul 18, 2000

US-PAT-NO: 6090800

DOCUMENT-IDENTIFIER: US 6090800 A

TITLE: Lipid soluble steroid prodrugs

DATE-ISSUED: July 18, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Shen; DeKang	Tucson	AZ		

US-CL-CURRENT: 514/180; 552/574

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 11. Document ID: US 6088613 A

L3: Entry 11 of 17 File: USPT Jul 11, 2000

US-PAT-NO: 6088613
DOCUMENT-IDENTIFIER: US 6088613 A

TITLE: Method of magnetic resonance focused surgical and therapeutic ultrasound

DATE-ISSUED: July 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 600/420; 600/437

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 12. Document ID: US 6028066 A

L3: Entry 12 of 17 File: USPT Feb 22, 2000

US-PAT-NO: 6028066
DOCUMENT-IDENTIFIER: US 6028066 A

TITLE: Prodrugs comprising fluorinated amphiphiles

DATE-ISSUED: February 22, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 514/180; 514/169, 552/507

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
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☐ 13. Document ID: US 6007839 A

L3: Entry 13 of 17 File: USPT Dec 28, 1999

US-PAT-NO: 6007839
DOCUMENT-IDENTIFIER: US 6007839 A

TITLE: Preparation of pharmaceutical compositions containing etherlipid-containing multiple lipid liposomes

DATE-ISSUED: December 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 264/4.1, 264/4.3, 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
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☐ 14. Document ID: US 5965159 A

L3: Entry 14 of 17 File: USPT Oct 12, 1999

US-PAT-NO: 5965159
DOCUMENT-IDENTIFIER: US 5965159 A

TITLE: Etherlipid-containing multiple lipid liposomes

DATE-ISSUED: October 12, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw Desc | Image

☐ 15. Document ID: US 5942246 A

L3: Entry 15 of 17 File: USPT Aug 24, 1999

US-PAT-NO: 5942246
DOCUMENT-IDENTIFIER: US 5942246 A

TITLE: Etherlipid containing multiple lipid liposomes

DATE-ISSUED: August 24, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 16. Document ID: US 5783566 A

L3: Entry 16 of 17 File: USPT Jul 21, 1998

US-PAT-NO: 5783566
DOCUMENT-IDENTIFIER: US 5783566 A

TITLE: Method for increasing or decreasing transfection efficiency

DATE-ISSUED: July 21, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mislick; Kimberly Ann	Los Angeles	CA		

US-CL-CURRENT: 514/44; 424/450, 435/325, 435/458, 514/1, 514/2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 17. Document ID: US 5762958 A

L3: Entry 17 of 17 File: USPT Jun 9, 1998

US-PAT-NO: 5762958
DOCUMENT-IDENTIFIER: US 5762958 A

TITLE: Multilipid component ether lipid liposomes

DATE-ISSUED: June 9, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Cranbury	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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L3: Entry 16 of 17 File: USPT Jul 21, 1998

DOCUMENT-IDENTIFIER: US 5783566 A
TITLE: Method for increasing or decreasing transfection efficiency

Brief Summary Text (36):
When transfection is performed in vivo, glycosaminoglycans and other polyanionic species in the plasma can adversely affect the transfection efficiency. Transfection efficiency can be increased by lowering the plasma concentration of glycosaminoglycans and, optionally, other polyanionic species, and can be decreased by increasing the plasma concentrations of glycosaminoglycans. Various compounds are known to lower the plasma concentration of glycosaminoglycans. These compounds include, but are not limited to, protease inhibitors, plasma lipoproteins, growth factors, lipolytic enzymes, extracellular matrix proteins, and platelet factor 4. Preferred compounds for minimizing the plasma concentration of glycosaminoglycans are protease inhibitors and plasma lipoproteins. More preferably, the compounds are protease inhibitors.

Brief Summary Text (41):
The plasma concentration of glycosaminoglycans can be lowered by adding an effective amount of a compound that decreases the plasma concentration of glycosaminoglycans. Examples of these compounds include, but are not limited to, protease inhibitors, plasma lipoproteins, growth factors, lipolytic enzymes, extracellular matrix proteins, and platelet factor 4.

Brief Summary Text (45):
Transfection efficiency can be increased by complexing genetic material with a cationic lipid that is covalently or ionically bound to an agent known to increase the amount of proteoglycans on the cell surface. Alternatively, neutral lipids, lysolipids and neutral phospholipids can be covalently or ionically bound to an agent known to increase the amount of proteoglycans on the cell surface, and these modified lipids can be included in a cationic liposome formulation. Cationic liposomes prepared from the resulting lipids also increase transfection efficiency by increasing the concentration of cell surface proteoglycans.

Detailed Description Text (16):
Other neutral lipids may be added to the desired cationic lipid or mixture of lipids. These lipids include, but are not limited to, lyso lipids, such as lysophosphatidylcholine (I-oleoyllysophosphatidylcholine), cholesterol, or neutral phospholipids such as dioleyl phosphatidyl ethanolamine (DOPE), dioleoyl phosphatidyl choline (DOPC), dimyristoyl phosphatidyl choline (DMPC), and dipalmitoyl phosphatidyl choline (DPPC). The ratios of lipids may vary to include a majority of cationic lipid in combination with cholesterol and/or mixtures of lyso or neutral lipids.

Detailed Description Text (19):
Various compounds are known to lower the plasma concentration of glycosaminoglycans. These compounds include, but are not limited to, protease inhibitors, plasma lipoproteins, growth factors, lipolytic enzymes, extracellular matrix proteins, and platelet factor 4. Preferred compounds for minimizing the plasma concentration of glycosaminoglycans are protease inhibitors and plasma lipoproteins. More preferably, the compounds are protease inhibitors.

Detailed Description Text (68):
Transfection efficiency can be increased by incorporating a lysophosphatide into the

liposome formulation. The lysophosphatides can be present in amounts up to approximately a third of the total lipid concentration. Preferred lysophosphatides include Iysophosphatidylcholines such as I-oleoyllysophosphatidylcholine and lysophosphatidylethanolamines. Particularly preferred lysophosphatides are DOTMA, 1,2-bis(oleoyloxy)3-(trimethylammonio)propane (DOTAP), Lipofectin (GIBCO/BRL, Gaithersburg, Md.) and mixtures of these.

Detailed Description Text (71):
Neutral phospholipids such as DOPE, DOPC, DMPC, and DPPC can also be added. The ratios of lipids may vary to include a majority of cationic lipid in combination with cholesterol and/or mixtures of lyso or other neutral lipids.

Detailed Description Text (78):
Some lipids already include ligands that are suitable for targeting various cell types. These include glycolipids, lipoproteins, glycoproteins, and hydrophobic proteins. Examples described in the literature include gangliosides (Jonah, et al., Biochem. Biophys. Acta 541:321 (1978)), lactosyl ceramide (Spanjer and Scherphof, Biochem. Biophys. Acta, 734:40 (1983)), and sialoglycoprotein (Takada et al., Biochem. Biophys. Acta, 802:237 (1984). Synthetic cholesterol derivatives covalently bound to sugars such as aminomannose have been described, for example, in Mauk, et al., Science 207:309 (1980). Vesicles including aminomannose derived cholesterol have been demonstrated to target EmT6 tumor cells. These compounds can be incorporated into the lipid bilayer when the liposomes are prepared. Dinitrophenyl caproylphosphatidylethanolamine and other phosphatidylethanolamine derivatives linking small peptides have also been directly incorporated into lipid bilayers. Proteins have been covalently linked to liposomes through thiol, hydroxy and/or amine groups on the protein and the lipid, using known coupling techniques, for example, carbodiimide or glutaraldehyde chemistry.

Detailed Description Text (116):
Transfection efficiency can be increased by complexing genetic material with a cationic lipid that is covalently or ionically bound to an agent known to increase the amount of proteoglycans on the cell surface. Alternatively, neutral lipids, lysolipids and neutral phospholipids can be covalently or ionically bound to an agent known to increase the amount of proteoglycans on the cell surface, and these modified lipids can be included in a cationic liposome formulation. Cationic liposomes prepared from the resulting lipids also increase transfection efficiency by increasing the concentration of cell surface proteoglycans.

CLAIMS:

4. The method of claim 3, wherein the cationic liposomes include lyso lipids, cholesterol, or neutral phospholipids.

6. The method of claim 3, wherein the liposomes comprise a lipid bound to a ligand, wherein the lipid is selected from the group consisting of neutral phospholipids, cationic phospholipids, cationic lipids, neutral lipids, and lysolipids, and wherein the ligand is selected from the group consisting of sugars, proteins, hormones, cytokines, lectins, major histocompatibility complex (MHC) and oligonucleotides that bind to or interact with a specific site.

15. The method of claim 1 performed in the presence of plasma, and further comprising administering an effective amount of a compound that reduces the plasma concentration of glycosaminoglycans to increase the efficiency of transfection relative to when the plasma exhibits normal glycosaminoglycan concentrations, wherein the compound that reduces the plasma concentration of glycosaminoglycans is selected from the group consisting of protease inhibitors, plasma lipoproteins, growth factors, lipolytic enzymes, extracellular matrix proteins and platelet factor 4.

34. A method for decreasing the efficiency of administration of complexes of genetic material and cationic species to cells comprising reducing the amount of proteoglycans on the cell surface by administering an effective amount of a compound that reduces the expression of proteoglycans on the cell surface, wherein the compound is selected from the group consisting of protease inhibitors, plasma lipoproteins, growth factors, lipolytic enzymes, extracellular matrix proteins,

platelet factor 4, IL-1 alpha and beta, and TNF-alpha, wherein the transfection is performed in vitro, in vivo or ex vivo.

35. The method of claim 34, wherein the compound is selected from the group consisting of protease inhibitors, plasma lipoproteins, growth factors, lipolytic enzymes, extracellular matrix proteins, and platelet factor 4.

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☐ 1. Document ID: US 6416740 B1

L3: Entry 1 of 17 File: USPT Jul 9, 2002

US-PAT-NO: 6416740
DOCUMENT-IDENTIFIER: US 6416740 B1

TITLE: Acoustically active drug delivery systems

DATE-ISSUED: July 9, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 424/9.52; 424/450, 424/9.5, 424/9.51

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 6414139 B1

L3: Entry 2 of 17 File: USPT Jul 2, 2002

US-PAT-NO: 6414139
DOCUMENT-IDENTIFIER: US 6414139 B1

TITLE: Silicon amphiphilic compounds and the use thereof

DATE-ISSUED: July 2, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Shen; Dekang	Tucson	AZ		
Wu; Guanli	Tucson	AZ		

US-CL-CURRENT: 556/404, 556/405, 556/425, 556/427, 556/428, 556/436, 556/437

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 3. Document ID: US 6403056 B1

L3: Entry 3 of 17 File: USPT Jun 11, 2002

US-PAT-NO: 6403056
DOCUMENT-IDENTIFIER: US 6403056 B1

TITLE: Method for delivering bioactive agents using cochleates

DATE-ISSUED: June 11, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 424/9.51; 424/400, 424/450, 424/502, 424/9.52

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Image

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☐ 4. Document ID: US 6231834 B1

L3: Entry 4 of 17 File: USPT May 15, 2001

US-PAT-NO: 6231834
DOCUMENT-IDENTIFIER: US 6231834 B1

TITLE: Methods for ultrasound imaging involving the use of a contrast agent and multiple images and processing of same

DATE-ISSUED: May 15, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Fritz; Thomas A.	Tucson	AZ		
Gertz; Edward W.	Paradise Valley	AZ		

US-CL-CURRENT: 424/9.51; 424/9.52, 600/431

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 5. Document ID: US 6180137 B1

L3: Entry 5 of 17 File: USPT Jan 30, 2001

US-PAT-NO: 6180137
DOCUMENT-IDENTIFIER: US 6180137 B1

TITLE: Etherlipid-containing multiple lipid liposomes

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 6. Document ID: US 6139819 A

L3: Entry 6 of 17 File: USPT Oct 31, 2000

US-PAT-NO: 6139819
DOCUMENT-IDENTIFIER: US 6139819 A

TITLE: Targeted contrast agents for diagnostic and therapeutic use

DATE-ISSUED: October 31, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Fritz; Thomas A.	Tucson	AZ		
Gertz; Edward W.	Paradise Valley	AZ		

US-CL-CURRENT: 424/9.52; 424/450, 424/9.51

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 7. Document ID: US 6133416 A

L3: Entry 7 of 17 File: USPT Oct 17, 2000

US-PAT-NO: 6133416
DOCUMENT-IDENTIFIER: US 6133416 A

TITLE: Inhibition of cell growth by an anti-proliferative factor

DATE-ISSUED: October 17, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wilson; Deborah R.	Houston	TX		
Lapadat-Tapolsky; Mary	The Woodlands	TX		
Timmons; Therese M.	Houston	TX		
Lee; Julia A.	Houston	TX		
Almond; Brian D.	Houston	TX		
Roth; Jack A.	Houston	TX		

US-CL-CURRENT: 530/300; 424/283.1, 436/63

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 8. Document ID: US 6123923 A

L3: Entry 8 of 17 File: USPT Sep 26, 2000

US-PAT-NO: 6123923
DOCUMENT-IDENTIFIER: US 6123923 A

TITLE: Optoacoustic contrast agents and methods for their use

DATE-ISSUED: September 26, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Wu; Yunqiu	Tucson	AZ		

US-CL-CURRENT: 424/9.52; 424/450, 424/9.1, 424/9.2, 424/9.3, 424/9.6, 514/410

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 9. Document ID: US 6120751 A

L3: Entry 9 of 17 File: USPT Sep 19, 2000

US-PAT-NO: 6120751
DOCUMENT-IDENTIFIER: US 6120751 A

TITLE: Charged lipids and uses for the same

DATE-ISSUED: September 19, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 424/9.51; 264/4, 264/4.1, 424/450, 424/502, 424/9.52, 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 10. Document ID: US 6090800 A

L3: Entry 10 of 17 File: USPT Jul 18, 2000

US-PAT-NO: 6090800

DOCUMENT-IDENTIFIER: US 6090800 A

TITLE: Lipid soluble steroid prodrugs

DATE-ISSUED: July 18, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		
Shen; DeKang	Tucson	AZ		

US-CL-CURRENT: 514/180; 552/574

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 11. Document ID: US 6088613 A

L3: Entry 11 of 17 File: USPT Jul 11, 2000

US-PAT-NO: 6088613
DOCUMENT-IDENTIFIER: US 6088613 A

TITLE: Method of magnetic resonance focused surgical and therapeutic ultrasound

DATE-ISSUED: July 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 600/420; 600/437

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw Desc | Image

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☐ 12. Document ID: US 6028066 A

L3: Entry 12 of 17 File: USPT Feb 22, 2000

US-PAT-NO: 6028066
DOCUMENT-IDENTIFIER: US 6028066 A

TITLE: Prodrugs comprising fluorinated amphiphiles

DATE-ISSUED: February 22, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Unger; Evan C.	Tucson	AZ		

US-CL-CURRENT: 514/180; 514/169, 552/507

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
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☐ 13. Document ID: US 6007839 A

L3: Entry 13 of 17 File: USPT Dec 28, 1999

US-PAT-NO: 6007839
DOCUMENT-IDENTIFIER: US 6007839 A

TITLE: Preparation of pharmaceutical compositions containing etherlipid-containing multiple lipid liposomes

DATE-ISSUED: December 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 264/4.1, 264/4.3, 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw Desc | Image

☐ 14. Document ID: US 5965159 A

L3: Entry 14 of 17 File: USPT Oct 12, 1999

US-PAT-NO: 5965159
DOCUMENT-IDENTIFIER: US 5965159 A

TITLE: Etherlipid-containing multiple lipid liposomes

DATE-ISSUED: October 12, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC
Draw Desc | Image

☐ 15. Document ID: US 5942246 A

L3: Entry 15 of 17 File: USPT Aug 24, 1999

US-PAT-NO: 5942246
DOCUMENT-IDENTIFIER: US 5942246 A

TITLE: Etherlipid containing multiple lipid liposomes

DATE-ISSUED: August 24, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Plainsboro	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 16. Document ID: US 5783566 A

L3: Entry 16 of 17 File: USPT Jul 21, 1998

US-PAT-NO: 5783566
DOCUMENT-IDENTIFIER: US 5783566 A

TITLE: Method for increasing or decreasing transfection efficiency

DATE-ISSUED: July 21, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mislick; Kimberly Ann	Los Angeles	CA		

US-CL-CURRENT: 514/44; 424/450, 435/325, 435/458, 514/1, 514/2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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☐ 17. Document ID: US 5762958 A

L3: Entry 17 of 17 File: USPT Jun 9, 1998

US-PAT-NO: 5762958
DOCUMENT-IDENTIFIER: US 5762958 A

TITLE: Multilipid component ether lipid liposomes

DATE-ISSUED: June 9, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mayhew; Eric	Monmouth Junction	NJ		
Janoff; Andrew S.	Yardley	PA		
Ahmad; Imran	Cranbury	NJ		
Bhatia; Suresh K.	New Delhi			IN

US-CL-CURRENT: 424/450; 428/402.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KWIC | Draw. Desc | Image

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L1	liposome$ same ceramide$	364	L1

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